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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,809	07/03/2003	Rick C. Stevens	5744EA-00252	6824
44341	7590	08/02/2005	EXAMINER	
JACOBSON & JOHNSON ONE WEST WATER STREET, SUITE 285 ST. PAUL, MN 55107			STAHL, MICHAEL J	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 08/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/613,809

Applicant(s)

STEVENS, RICK C.

Examiner

Mike Stahl

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 10-18 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10-18 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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This Office action is in response to the amendment filed May 19 2005. All objections made in the last action are withdrawn in view of the amendment. Claims 1-6, 10-18, and 20 remain in the application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6, 10-18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (US 6580858).

Claims 1 and 10: Chen discloses a post packaging alignable optical coupling (fig. 5) comprising: a base **101**; a first optical element **135** for receiving or transmitting an optical signal, the first optical element located in a fixed condition on the base; a second optical element **10** for receiving or transmitting an optical signal; a mirror **131** interposed to intercept an optical signal from one of the optical elements, the mirror moveably disposed with respect to the base; and a MEMS actuator **139**, the actuator supporting the mirror to enable repositioning the mirror to direct the optical signal from the first optical element into alignment with the second optical element or vice versa.

Chen does not expressly disclose a shroud which encompasses the optical elements. Shrouds for integrated optical devices are well known in the art. It would have been obvious to a skilled person at the time the invention was made to have provided the Chen module with a

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shroud since this would prevent undesirable contamination of the optical surfaces. The mirror may be remotely repositioned with the MEMS actuator when the shroud extends over the optical elements.

Claim 2: The second optical element 10 is fixedly mounted to the base (col. 4 lns. 10-12).

Claim 3: One of the optical elements is an optical fiber.

Claim 4: The first optical element and the second optical element are located in a transverse condition from each other.

Claim 5: The first optical element and the optical fiber are located at substantially a right angle to each other.

Claim 6: The optical coupling includes at least four optical elements (the fig. 5 embodiment in particular includes five mirrors which are involved in the coupling).

Claim 10: The process of making the Chen module including the proposed modification (addition of a shroud) would have met the limitations of claim 10.

Claim 11: Chen does not disclose an embodiment in which a single mirror is rotatable and tiltable (i.e. a mirror having two rotation axes). Instead Chen uses one mirror 131 with a single rotation axis and another mirror 133 which is translated. The effect of these combined motions is to control the relative x or y positions of the beam upon the device 135 (col. 4 lns. 16-33). Two-axis MEMS mirrors were well known in the art at the time the invention was made. It would have been obvious to a skilled person to have further modified the Chen module by replacing the two movable mirrors with a single two-axis mirror since this could accomplish the same x-y positioning with one fewer mirror. The resultant device would also have been more

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optically efficient since each additional mirror reduces the efficiency as suggested at col. 4 ln. 55
- col. 5 ln. 11.

Claim 12: The Chen module couples a single fiber **10** to a single device **135**, but Chen does not disclose an embodiment wherein multiple fibers are coupled to multiple respective devices via multiple respective repositionable mirrors. However, it has been held that duplication of parts is not patentably significant unless an unexpected result is produced (In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960)). In the present case, it would have been obvious to a skilled person to have constructed the Chen module with at least an additional fiber, an additional device, and an additional train of coupling mirrors, in order to provide the module with a higher signal handling capacity and/or to provide for bidirectional communication.

Claim 13: The method of making the Chen module further includes fixedly mounting an optical conductor **10** to the base.

Claim 14: The method of making the Chen module further includes fixedly mounting a second optical element **135** to the base.

Claim 15: A MEMS actuator **139** is mounted to the base and to the mirror **131**.

Claims 16-18: The limitations of these claims are met by the Chen module as noted above with respect to various preceding claims. It is noted that the mirror **131** has a reflecting surface larger than an optical port (such as the core of fiber **10** or the aperture of device **135**).

Claim 20: Chen does not refer to shipping. It would have been obvious to a skilled person to have constructed and packaged for shipment the basic module of fig. 5, and to have shipped the module without first aligning the optical elements, since this would have saved a processing step at the factory (e.g. the alignment procedure could be outsourced or finalized by

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an end user of the module), and since it would have avoided any problems with de-alignment of the elements due to forces experienced during shipping.

Response to Arguments

The arguments related to the rejections under Chen et al. in the last action have been considered but are not persuasive. The arguments allege that Chen is not directed to post-packaging optical coupling but instead teaches performing the optical alignments without a shroud present. The last Office action acknowledged the lack of a shroud in the Chen reference; hence the obviousness rejection. It is submitted that alignment can still be performed in the Chen device even after a shroud is added. Control of the mirror positions is done electrically and it is not seen how the presence of a shroud would disable this function. The arguments further allege that using a shroud with the Chen device would prevent the use of a reference signal for alignment as described at col. 3 lns. 46-55. However, the indicated passage refers to the embodiment of fig. 3, which was not relied upon in the rejection. Furthermore, this particular argument assumes that the shroud would be opaque and that the reference signal light source would be located exterior to the shroud, and neither condition appears to be specifically necessitated by the Chen disclosure. The arguments allege that the last action used the claims as a template for the obviousness rejections of the dependent claims. It has been held that so long as a rejection takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned *only* from an applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Finally, the arguments seem to allege that “optical coupling” is

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not done by the Chen device. However, it is clear that the Chen device optically couples elements 10 and 135; the path of the beam is plainly shown in fig. 5. In regard to the "post packaging" descriptor, the lack of a particular mention of post packaging alignment in Chen does not mean that the disclosed device (or the modified device) is incapable of such alignment.

Conclusion

Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The additional references listed on the attached PTO-892 form are considered relevant to this application. In particular, US 6735355 discloses a sealing structure for an optical switch; US 6502999 describes in the background the importance of avoiding contamination in an optical

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device package; and US 2005/0135742 discloses an optical coupling with adjustable mirrors (though it is not prior art).

Inquiries about this letter should be directed to Mike Stahl at 571-272-2360. Inquiries of a general or clerical nature (e.g., a request for a missing form or paper, etc.) should be directed to the technical support staff supervisor at 571-272-1626. Official communications which are eligible for submission by facsimile and which pertain to this application may be faxed to 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MSS

Mike Stahl
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July 27, 2005



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